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Manual for Micro-Manager with digital system d-Drive®

Content

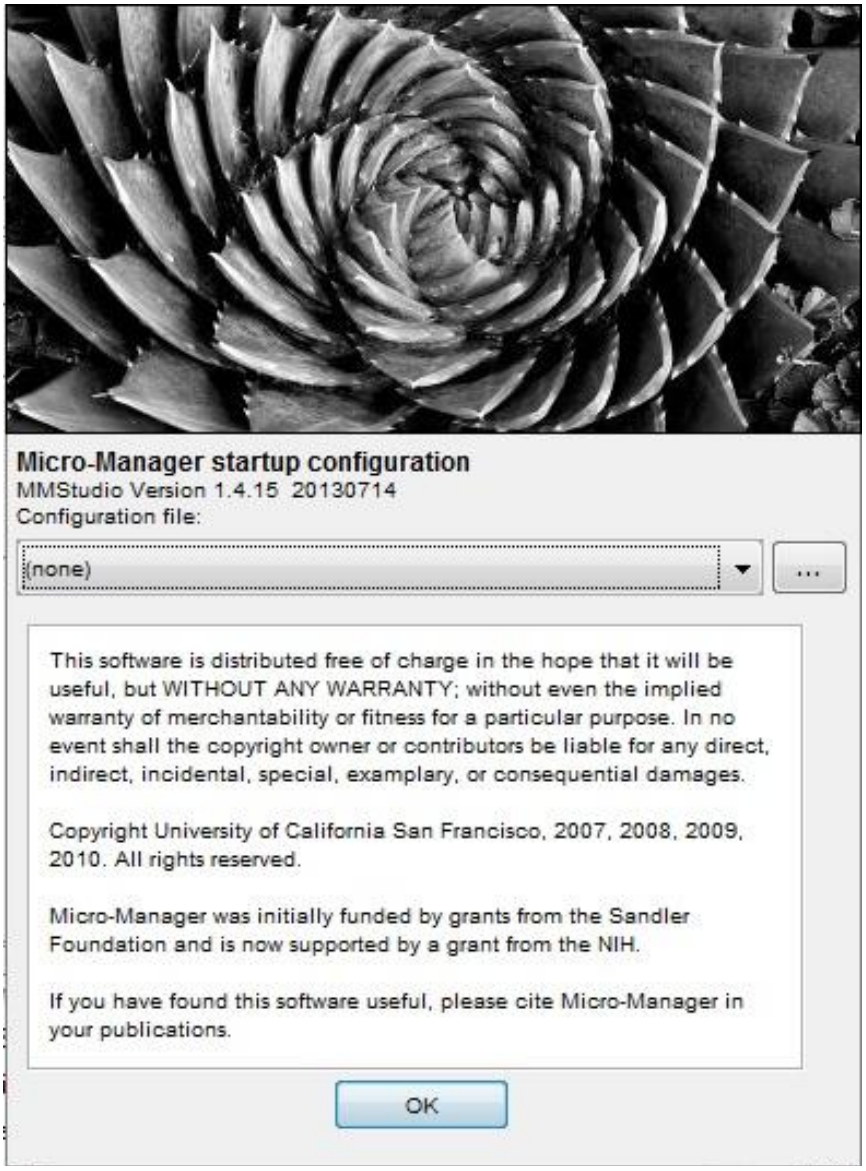
1 Installation

To use the Micro-Manager, a download of the software from the homepage is required. In this download-package are all needed libraries of the dDrive included. Please follow the instructions to install it.

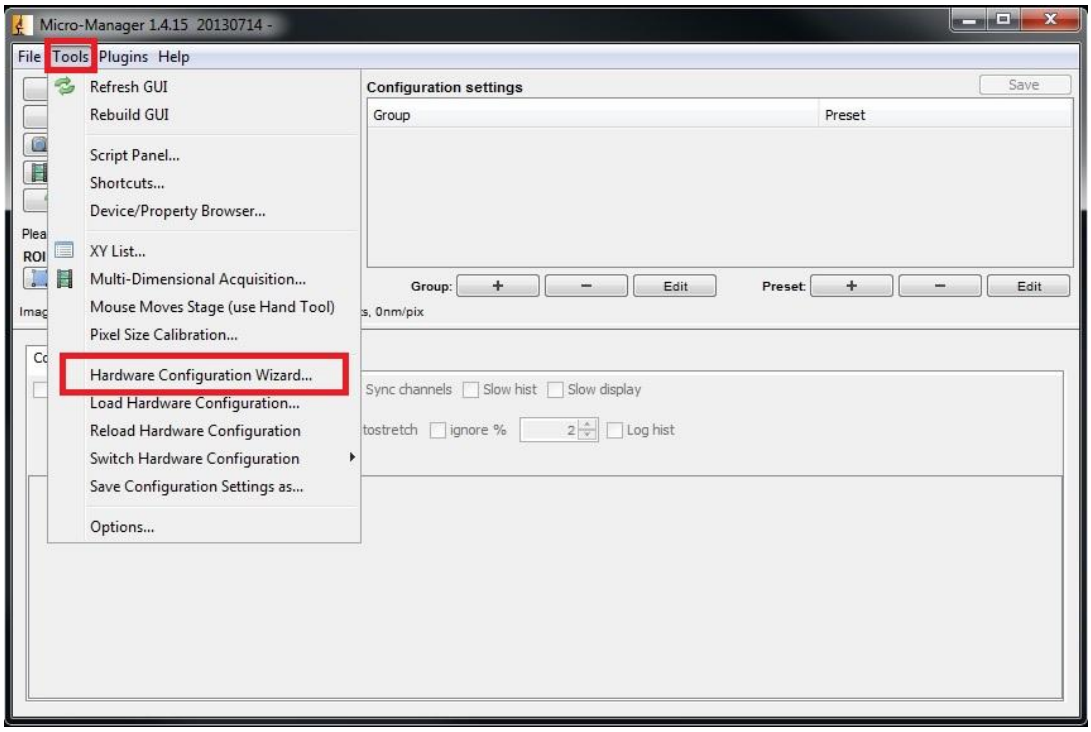
If an older version (before 1.4.15) of Micro-Manager is installed, a download of the library of the digital system from piezosystem jena is required.
Afterwards the file „mmgr_dal_Piezosystem_dDrive.dll“ must be extracted in the main directory of the program. Now you are able to access in program.

2 Hardware configuration

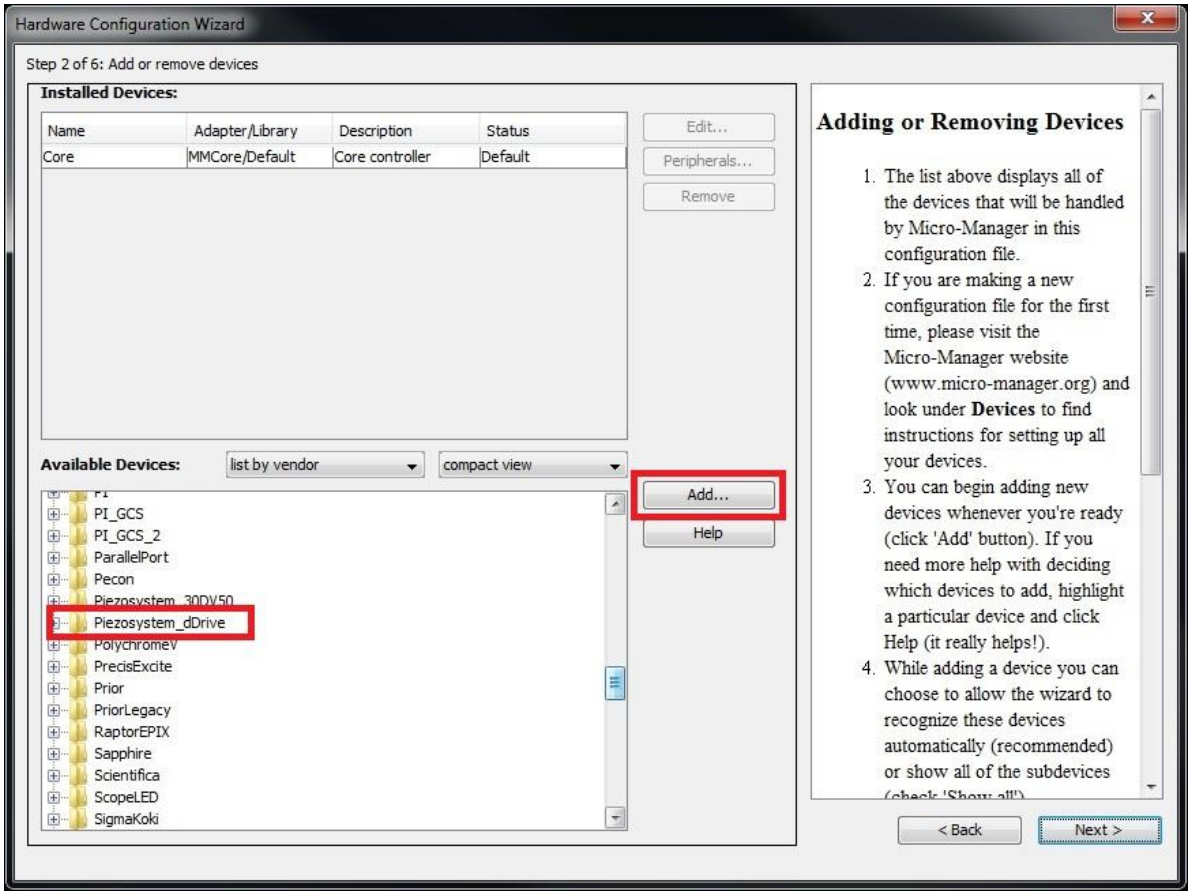
The Micro-Manager should be started without configuration („none“). Close the Window with “OK”.



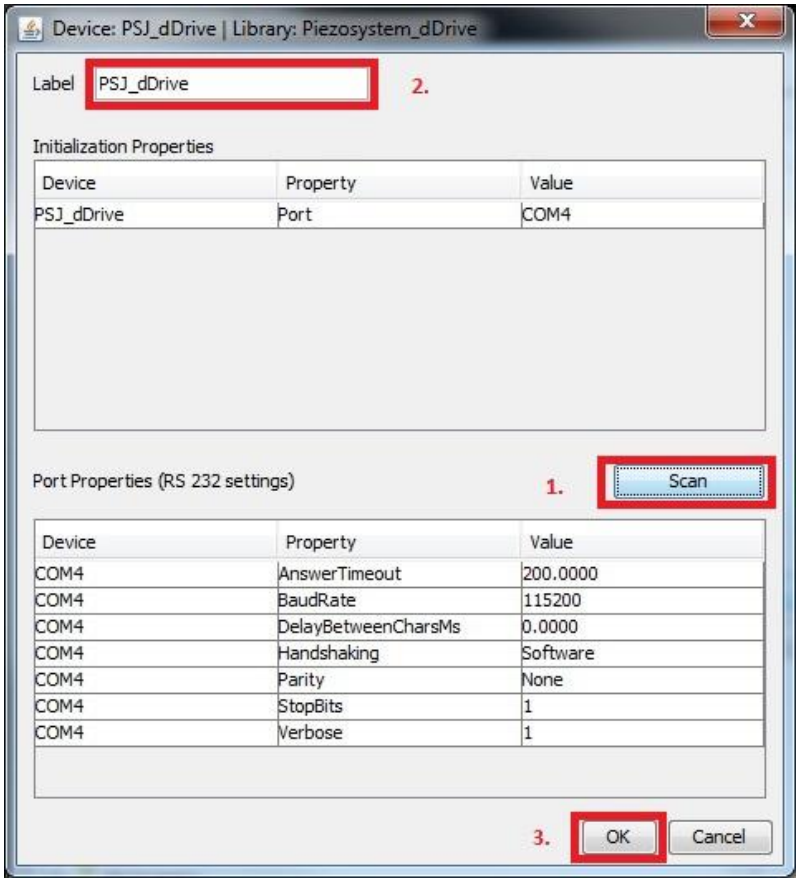
To use the dDrive, a configuration file must be created. It must be switched on. To configure, please click in Menu **Tools→Hardware Configuration Wizard**.



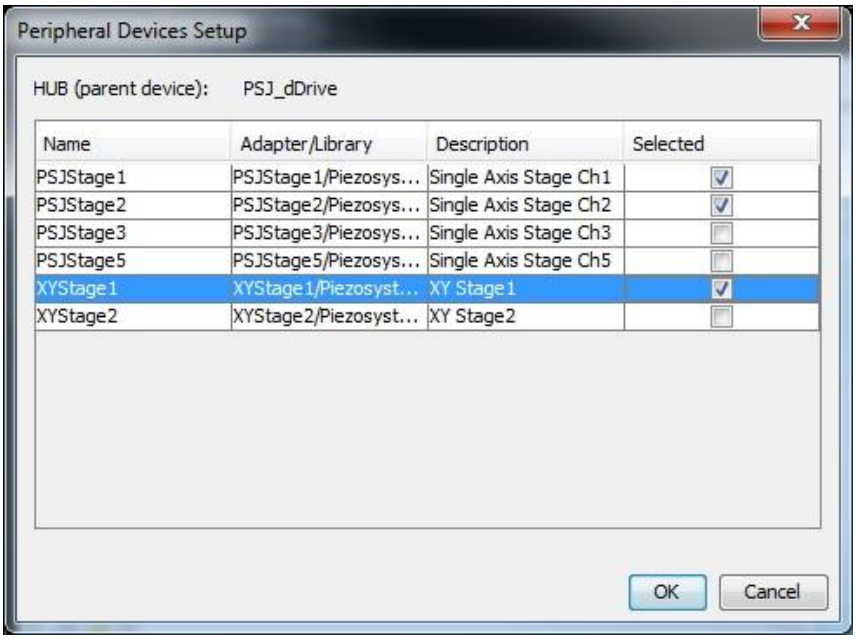
A new window will be opened. Please go to the second step with button „Next“, look for Piezosystem_dDrive and add it to the list with a double click or push button „Add…“.



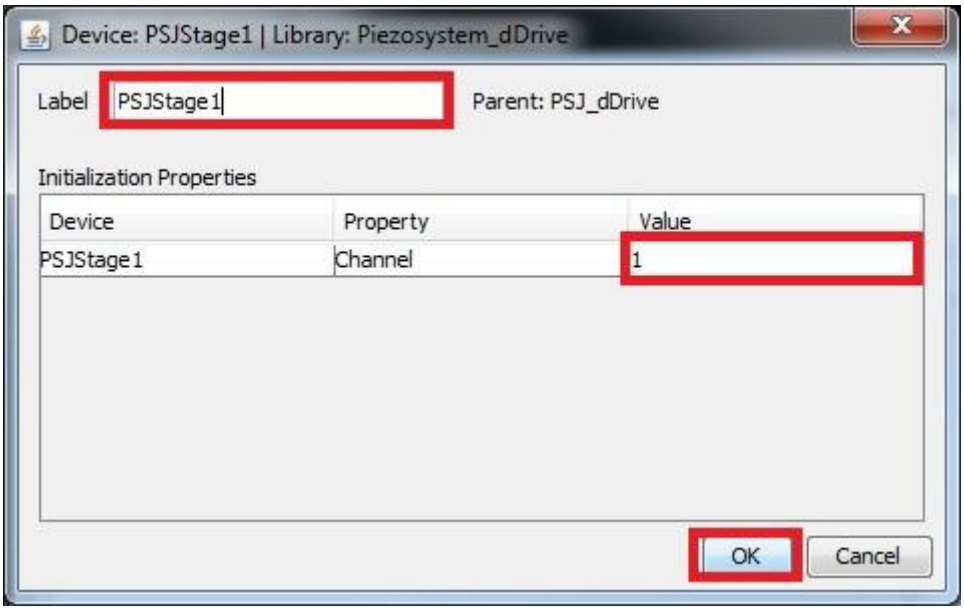
Now a new window is opening for the port setting. Click on the button „Scan“ and let the program search the device. At “Label” you could give the device an own name. Accept the settings with "OK".



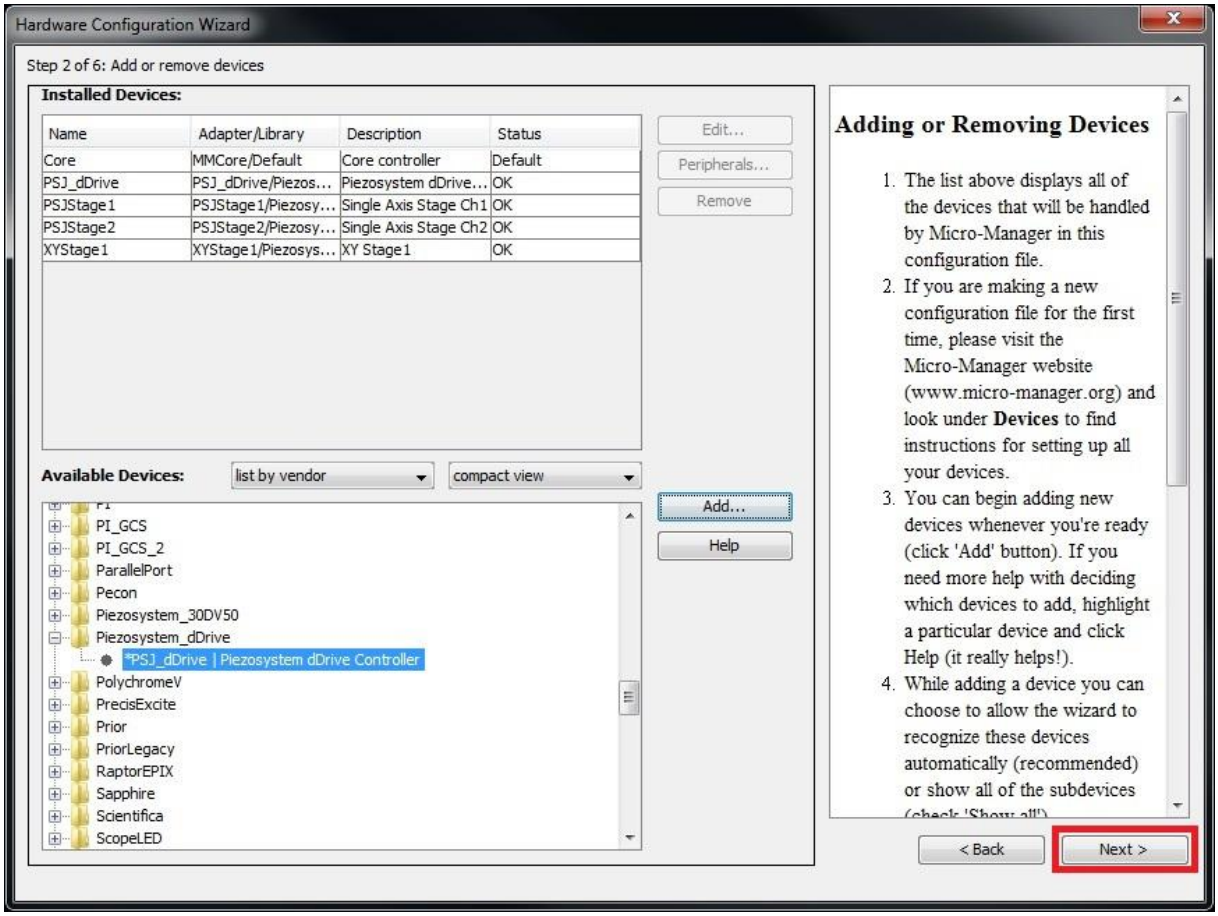
Please choose in the next window the correct actuator with the checkbox in the column „Selected“. Accept it by clicking "OK".



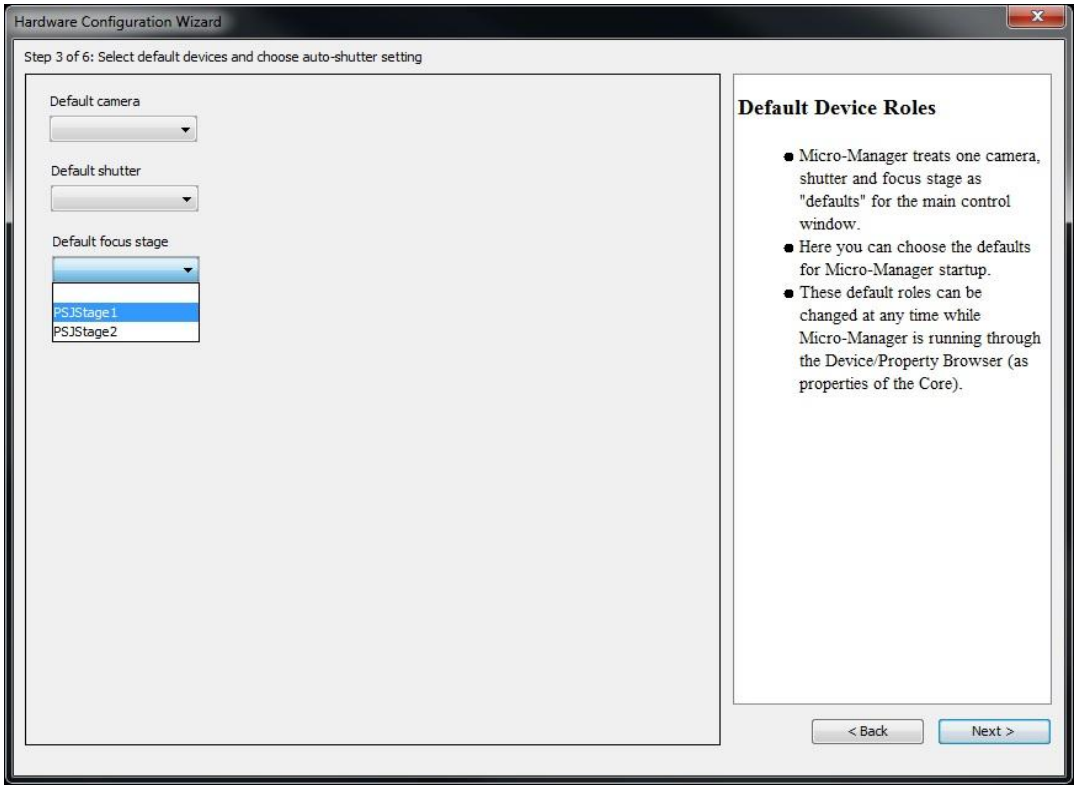
Please choose in the next window the channel number and an own actuator name. Accept again by clicking "OK".



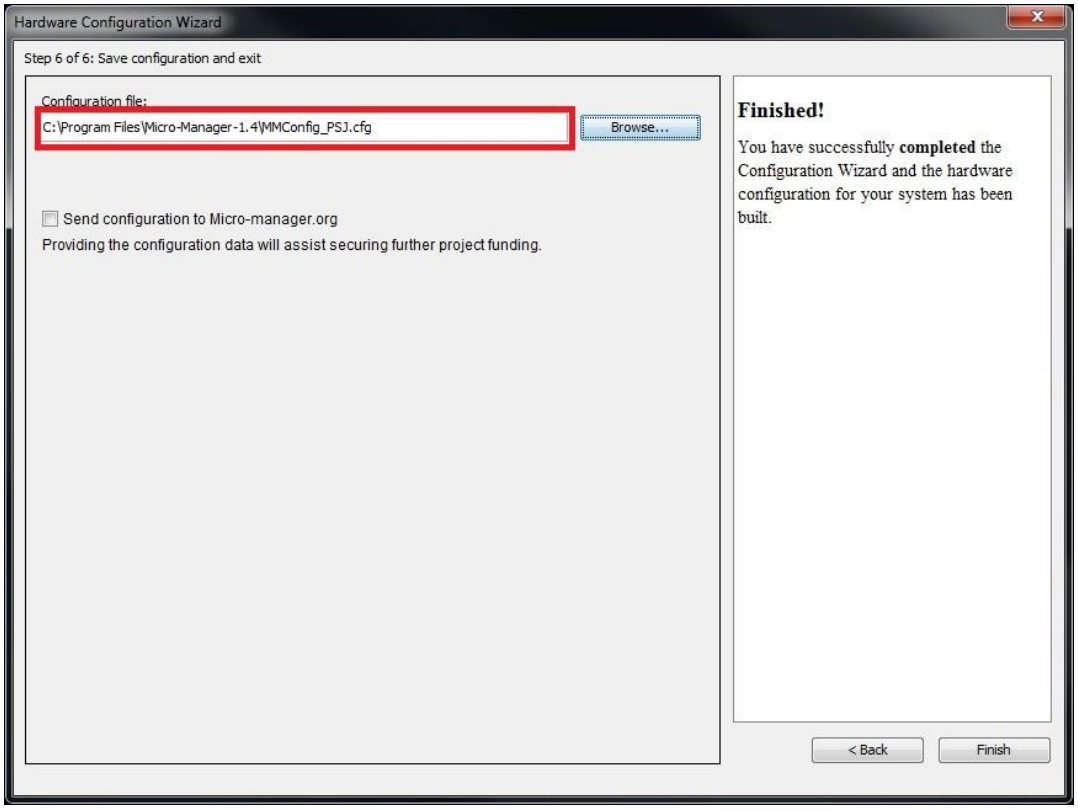
After the last actuator you come back to the configure window. Accept by clicking the button „Next >“.



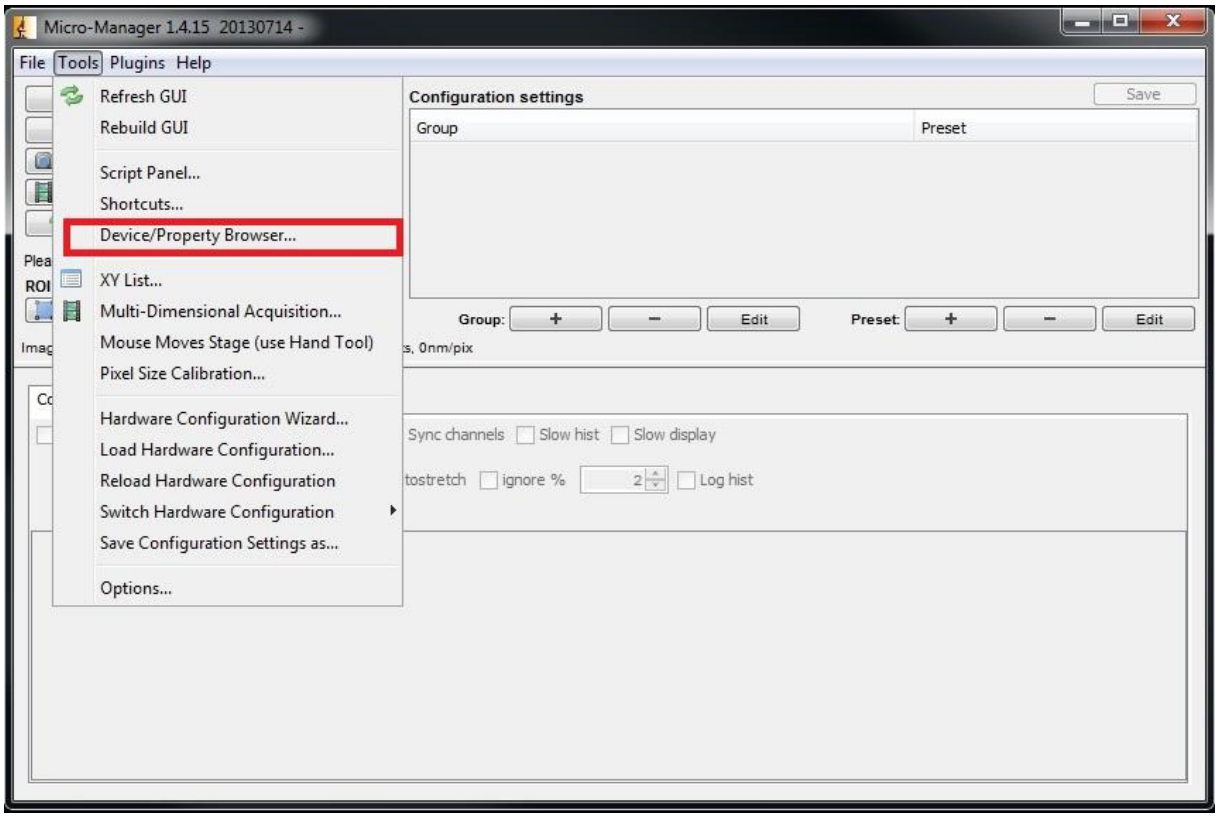
In the subsequent window you could choose default device. This can be changed later again.

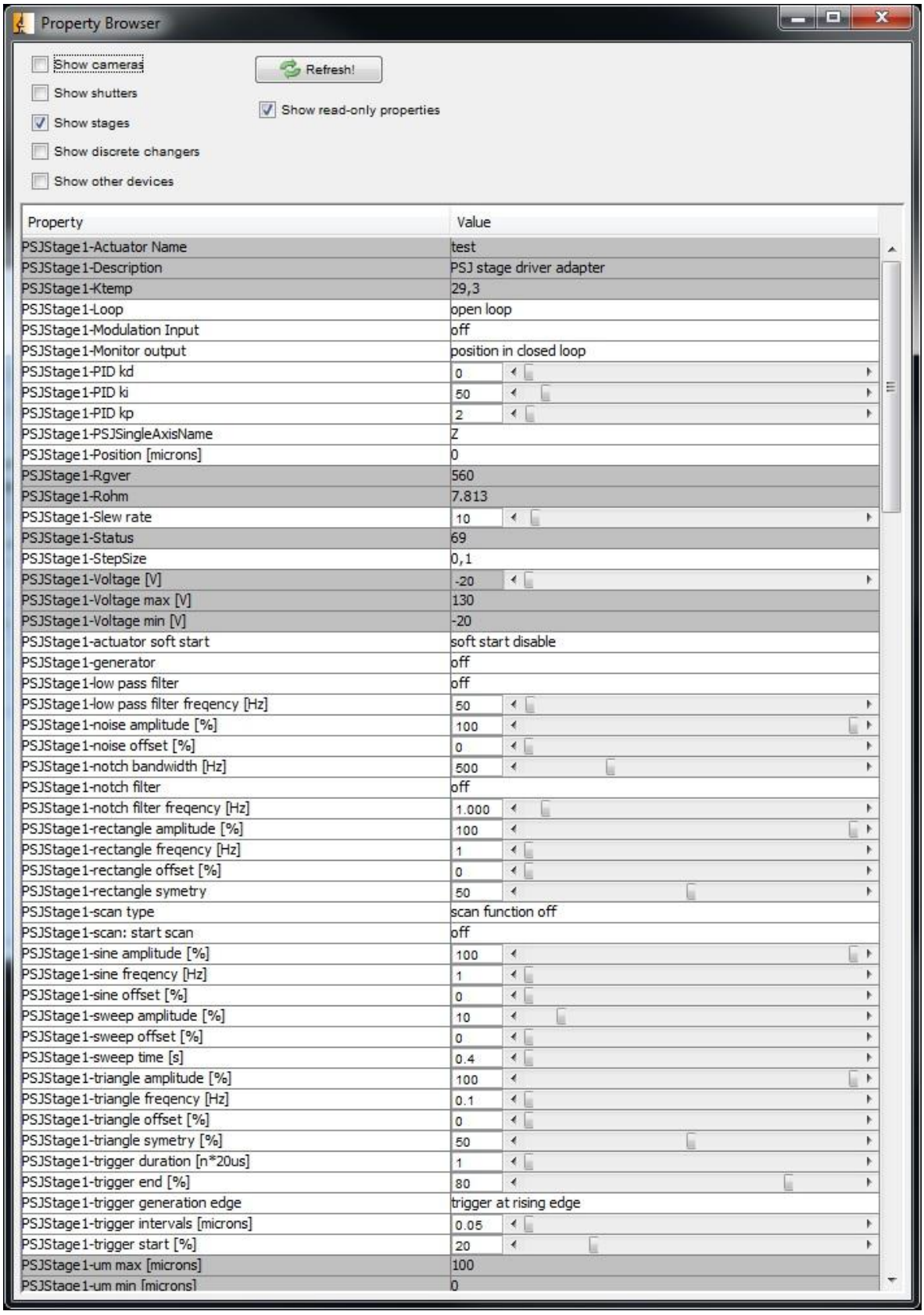


Skip step 4 and 5 with “next” and save the configuration in a file. This can be loaded at the next program start. Close the Wizard with „Finish“.



After successful configuration the dDrive can be loaded and handled by the “Property Browser”. It is located at **Tools→Device/Property Browser**


Micro-Manager 1.4.15 20130714 -
File
Tools
Plugins
Help
Refresh GUI
Rebuild GUI
Script Panel...
Shortcuts...
Device/Property Browser...
XY List...
Multi-Dimensional Acquisition...
Mouse Moves Stage (use Hand Tool)
Pixel Size Calibration...
Hardware Configuration Wizard...
Load Hardware Configuration...
Reload Hardware Configuration
Switch Hardware Configuration
Save Configuration Settings as...
Options...
Configuration settings
Save
Group
Preset
Group:
Edit
Preset:
Edit
Sync channels
Slow hist
Slow display
tostretch
ignore %
Log hist



Property	Value
PSJStage1-Actuator Name	test
PSJStage1-Description	PSJ stage driver adapter
PSJStage1-Ktemp	29,3
PSJStage1-Loop	open loop
PSJStage1-Modulation Input	off
PSJStage1-Monitor output	position in closed loop
PSJStage1-PID kd	0
PSJStage1-PID ki	50
PSJStage1-PID kp	2
PSJStage1-PSJSingleAxisName	Z
PSJStage1-Position [microns]	0
PSJStage1-Rgver	560
PSJStage1-Rohm	7.813
PSJStage1-Slew rate	10
PSJStage1-Status	69
PSJStage1-StepSize	0,1
PSJStage1-Voltage [V]	-20
PSJStage1-Voltage max [V]	130
PSJStage1-Voltage min [V]	-20
PSJStage1-actuator soft start	soft start disable
PSJStage1-generator	off
PSJStage1-low pass filter	off
PSJStage1-low pass filter freqency [Hz]	50
PSJStage1-noise amplitude [%]	100
PSJStage1-noise offset [%]	0
PSJStage1-notch bandwidth [Hz]	500
PSJStage1-notch filter	off
PSJStage1-notch filter freqency [Hz]	1.000
PSJStage1-rectangle amplitude [%]	100
PSJStage1-rectangle freqency [Hz]	1
PSJStage1-rectangle offset [%]	0
PSJStage1-rectangle symetry	50
PSJStage1-scan type	scan function off
PSJStage1-scan: start scan	off
PSJStage1-sine amplitude [%]	100
PSJStage1-sine freqency [Hz]	1
PSJStage1-sine offset [%]	0
PSJStage1-sweep amplitude [%]	10
PSJStage1-sweep offset [%]	0
PSJStage1-sweep time [s]	0.4
PSJStage1-triangle amplitude [%]	100
PSJStage1-triangle freqency [Hz]	0.1
PSJStage1-triangle offset [%]	0
PSJStage1-triangle symetry [%]	50
PSJStage1-trigger duration [n*20us]	1
PSJStage1-trigger end [%]	80
PSJStage1-trigger generation edge	trigger at rising edge
PSJStage1-trigger intervals [microns]	0.05
PSJStage1-trigger start [%]	20
PSJStage1-um max [microns]	100
PSJStage1-um min [microns]	0

The settings are sorted alphabetically. The grey filled fields can only be read and are for information.

3 Edit configuration file in text editor

The configuration file can be edited with any text editor. The following points can be changed:

- label
- channel of device
- port number
- split Tritor in XYStage and ZStage

For example here is a file with „Label“ instead of device name. This should be changed to useful names.

```
# Reset
Property,Core,Initialize,0

# Devices
Device,COM4,SerialManager,COM4
Device,Label_1,Piezosystem_dDrive,PSJ_dDrive
Device,Label_2,Piezosystem_dDrive,PSJ_Tritor1
Device,Label_3,Piezosystem_dDrive,PSJ_Shutter1

# Pre-init settings for devices
Property,Label_1,Port,COM4
Property,Label_2,Channel X,1
Property,Label_2,Channel Y,2
Property,Label_2,Channel Z,3
Property,Label_3,Channel,5
Property,Label_3,Version (zero volt position),edges open

# Pre-init settings for COM ports
Property,COM4,AnswerTimeout,500.0000
Property,COM4,BaudRate,115200
Property,COM4,DelayBetweenCharsMs,0.0000
Property,COM4,Handshaking,Software
Property,COM4,Parity,None
Property,COM4,StopBits,1
Property,COM4,Verbose,1

# Hub (parent) references
Parent,Label_2,Label_1
Parent,Label_3,Label_1

# Initialize
Property,Core,Initialize,1

# Delays

# Roles
Property,Core,Shutter,Label_3
Property,Core,AutoShutter,1

# Camera-synchronized devices

# Labels

# Configuration presets
# Group: Channel

# Group: System
# Preset: Startup
```

```
# PixelSize settings
```

The Label should be changed to:

- Label_1 → dDrive
- Label_2 → Tritor
- Label_3 → Shutter

```
# Reset
Property,Core,Initialize,0

# Devices
Device,COM4,SerialManager,COM4
Device,dDrive,Piezosystem_dDrive,PSJ_dDrive
Device,Tritor,Piezosystem_dDrive,PSJ_Tritor1
Device,Shutter,Piezosystem_dDrive,PSJ_Shutter1

# Pre-init settings for devices
Property,dDrive,Port,COM4
Property,Tritor,Channel X,1
Property,Tritor,Channel Y,2
Property,Tritor,Channel Z,3
Property,Shutter,Channel,5
Property,Shutter,Version (zero volt position),edges open

# Pre-init settings for COM ports
Property,COM4,AnswerTimeout,500.0000
Property,COM4,BaudRate,115200
Property,COM4,DelayBetweenCharsMs,0.0000
Property,COM4,Handshaking,Software
Property,COM4,Parity,None
Property,COM4,StopBits,1
Property,COM4,Verbose,1

# Hub (parent) references
Parent,Tritor,dDrive
Parent,Shutter,dDrive

# Initialize
Property,Core,Initialize,1

# Delays

# Roles
Property,Core,Shutter,Shutter
Property,Core,AutoShutter,1

# Camera-synchronized devices

# Labels

# Configuration presets
# Group: Channel

# Group: System
# Preset: Startup

# PixelSize settings
```

Please ensure that the name is only used once and commas are not used in the name.

At the next step the Tritor should be converted in XY Stage and Z Stage.

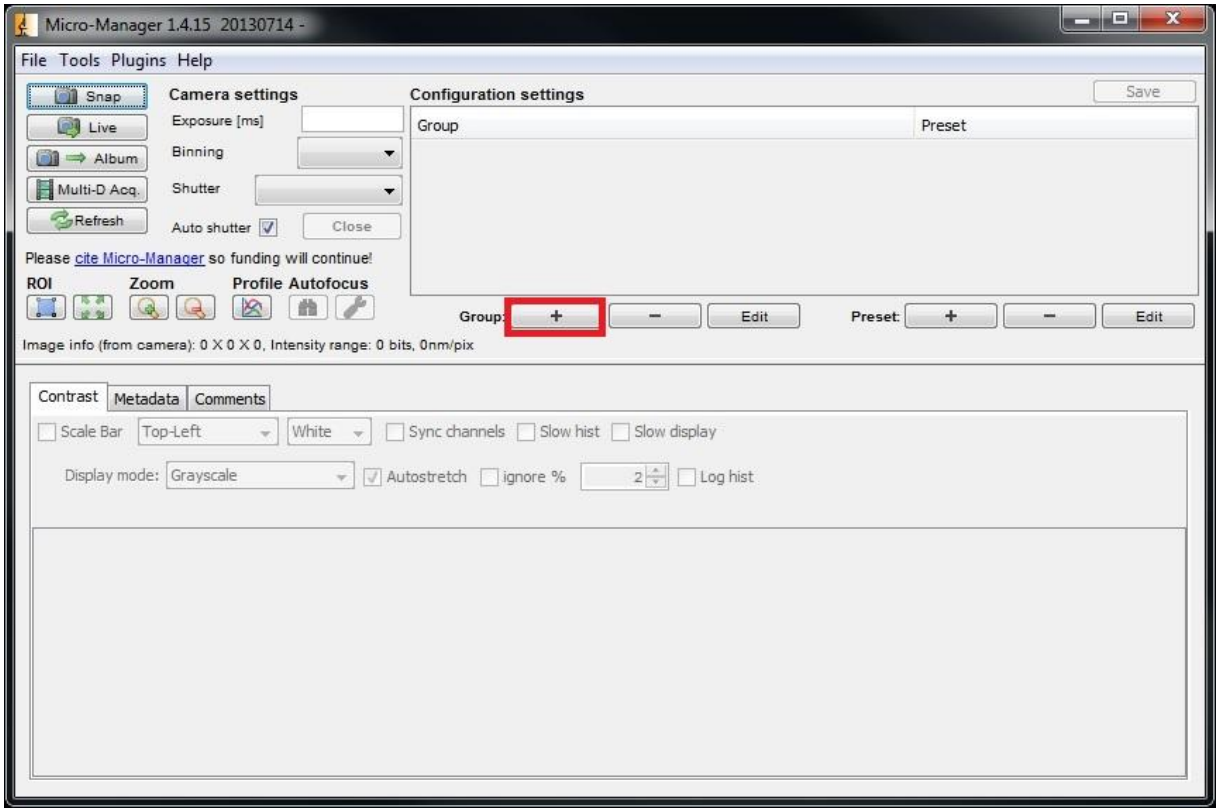
1. At „Devices" the PSJ_Tritor will be replace with PSJ_XYStage and PSJ_Stage.
2. At „Pre-init setting for device" the label will be replace and at Channel Z the „Z" remove.
3. At „Hub (parent) references" the Tritor will be replace with XYStage and Stage.

```
# Reset
Property,Core,Initialize,0

# Devices
Device,COM4,SerialManager,COM4
Device,dDrive,Piezosystem_dDrive,PSJ_dDrive
Device,XYStage,Piezosystem_dDrive,PSJ_XYStage1
Device,Stage,Piezosystem_dDrive,PSJ_Stage1
Device,Shutter,Piezosystem_dDrive,PSJ_Shutter1

# Pre-init settings for devices
Property,dDrive,Port,COM4
Property,XYStage,Channel X,1
Property,XYStage,Channel Y,2
Property,Stage,Channel,3
Property,Shutter,Channel,5
Property,Shutter,Version (zero volt position),edges open

# Pre-init settings for COM ports
Property,COM4,AnswerTimeout,500.0000
Property,COM4,BaudRate,115200
Property,COM4,DelayBetweenCharsMs,0.0000
Property,COM4,Handshaking,Software
Property,COM4,Parity,None
Property,COM4,StopBits,1
Property,COM4,Verbose,1

# Hub (parent) references
Parent,XYStage,dDrive
Parent,Stage,dDrive
Parent,Shutter,dDrive

# Initialize
Property,Core,Initialize,1

# Delays

# Roles
Property,Core,Shutter,Shutter
Property,Core,AutoShutter,1

# Camera-synchronized devices

# Labels

# Configuration presets
# Group: Channel

# Group: System
# Preset: Startup

# PixelSize settings
```

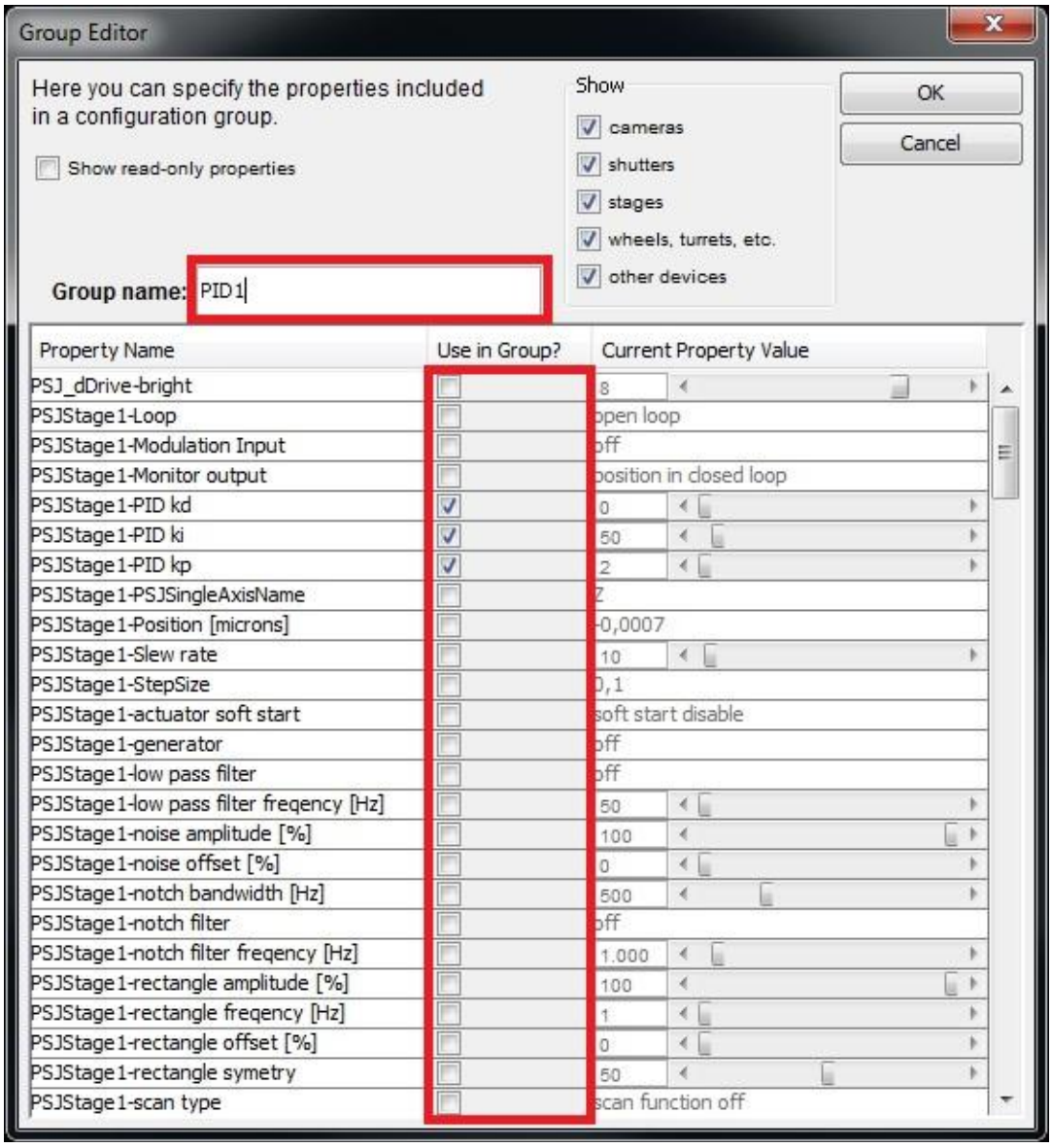
NOTE: The Stages can also only added. The Tritor and the Stages operate parallel in the program.

4 Create personal settings

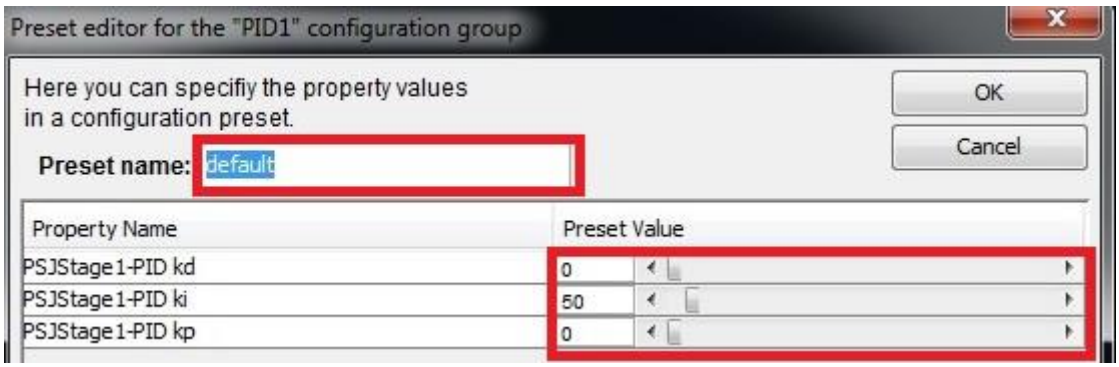
Settings should be done in „Configuration settings“. The Property Browser is very slow and should only give an overview. Personal settings are stored in the configuration file, which was created earlier.
First create a group for setting. Push the button „+“ at „Group“.



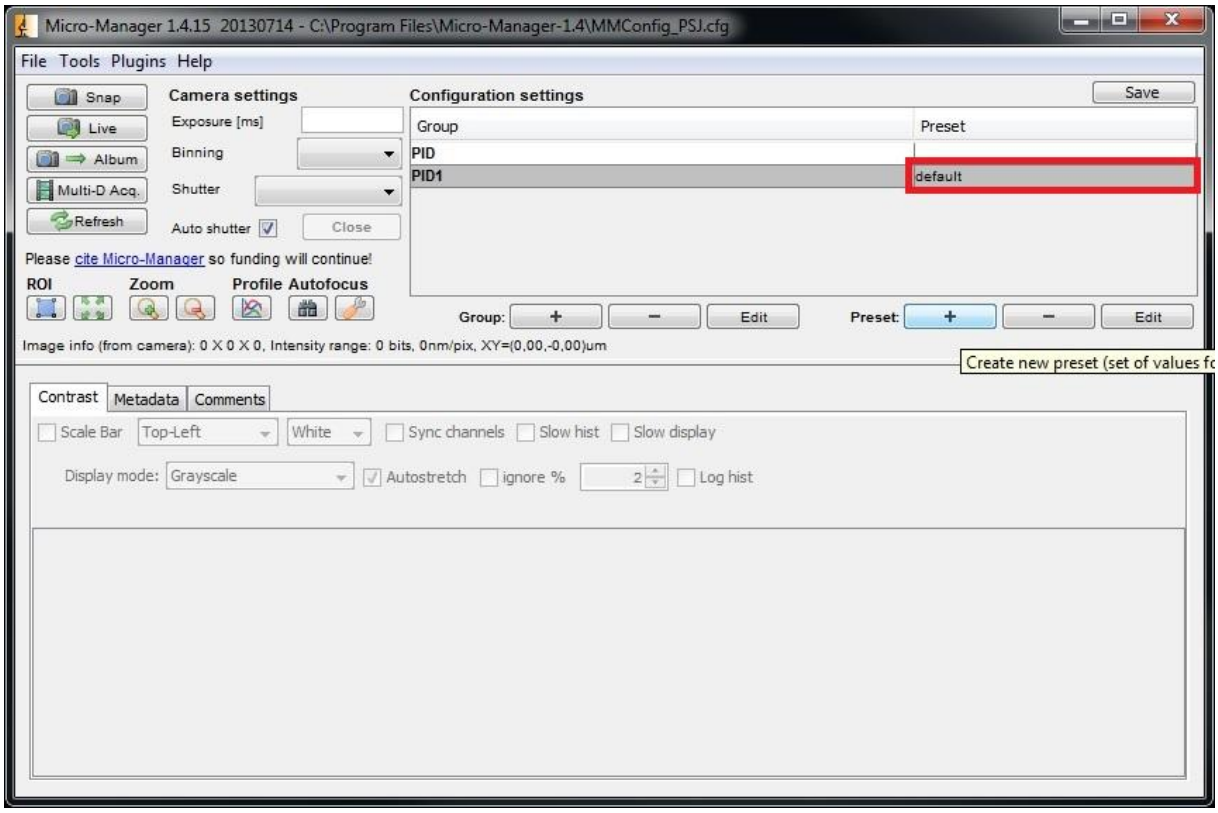
In the “Group Editor” a name for a group can be chosen and the properties be selected. Accept with „OK“.



In the next window the settings must be named and the values set.

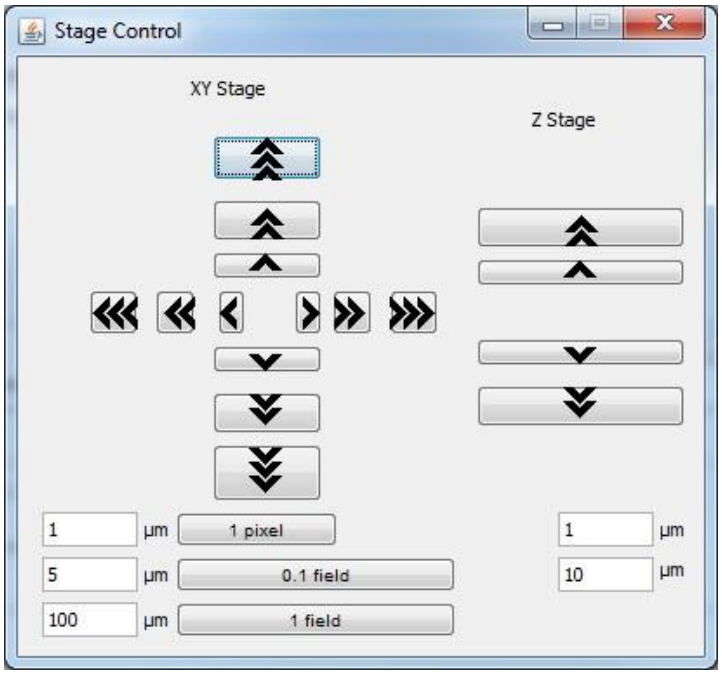


The settings can now transmit to dDrive in the main window.



5 Control with plug-ins

The position can also be controlled by the plug-in „Stage Control“. For this a XY Stage and a Stage for the Z-axis is needed.



It is possible to write own plug-ins in Java or create own GUIs with Netbean.